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Adding and Subtracting Like Terms

1. State whether the following are like terms, or not.

   YES/NO

   a) \(2x + 5x\) ____________

   b) \(15x^2 + 2\) ____________

   c) \(18xy^2 + 2x^1y^2\) ____________

   d) \(8x^3 + 4x^2\) ____________

   e) \(6xy^2 + 12y^2x\) ____________

   f) \(3xy + 4x\) ____________

2. Combine the 'like terms' into a simpler expression

   a) \(2x + 6x - 1\)  

   b) \(9x + 10y - 5 - 2y + 11x\)

   c) \(2x - 6x - 3\)

   d) \(-4x - 10x + 5 + 14x^2 - 8\)

   e) \(-14 - 12x - 3x^2 - 6x + 3x^2\)

   f) \(3x + 2x - 3 - 3x + 9\)
3. Simplify the following expressions.

a) $4 + 3 + (7 + 2)$  

b) $4 + 3 - (7 - 2)$

c) $2x + 4 + (-3x - 2)$  

d) $6x^2 - 3x^2 + (3 - 4x^2 - 2)$

e) $7x - 9 - (4x + 3)$  

f) $-6x + 3x^2 - (-5x^2 - 6x)$

g) $-18x + 2 + 8x - (12x + 2)$  

h) $8xy + 5 - 4yx - (-5 + 4xy)$
Isolating Variables – 01

1. For each equation, gather the like terms and solve for ‘x’

   a) \(3x = 36\)                           b) \(4 = -7x - 10\)

   c) \(-2x = 18\)                           d) \(-0.5x + 4 = 2.5x - 20\)

   e) \(4x + 12 = 72\)                      f) \(3x + 3 = -2x + 38\)

   g) \(-2x - 44 = 90\)                     h) \(3.5 - 4x = 2x - 8.5\)
2. For each equation, gather the like terms and solve for ‘x’

a) $1.25x - 27 = 13$

b) $103 = -0.6x + 11$

c) $\frac{x}{4} - 15 = 82$

d) $-11.5x + 173 = 3.25x - 387.5$

3. With a $50 bill, you can buy 14 cookies and get $28.30 in change.

a) What does ‘x’ represent? ____________________

b) How much does a cookie cost?

Answer: A cookie costs $____________________
Isolating Variables – 02

1. For each equation, gather the like terms and solve for ‘x’

a) $3x + 4 = 2x + 1$

b) $5x - 6 = 3x - 2$

c) $x - 6 = -2x$

d) $x + 3 = 2x + 3$

e) $2x - 3 = -3x + 2$

f) $2x - 4 = 0.25x + 3$

g) $4x + 1 = x - 2$

h) $-0.25x + 3 = -1.5x - 2$
2. For each equation, gather the like terms and solve for ‘x’

a) \(-9x + 3 = -6x - 12\)  
b) \(18.5x + 210 = 3.5x - 105\)

c) \(-2x - 4 = 4x + 2\)  
d) \(-\frac{3}{2}x + 4 = 1.5x - 2\)

3. You start a bank account with $55 and deposit $25 a month every month.

a) What does ‘x’ represent? ________________  

b) How many months will it take you to have $505 in your account?

**Answer:** It will take ____________ months.
Isolating Variables – 03

1. For each equation, gather the like terms and solve for ‘x’

   a) $6x + 7 = 52$

   b) $0.6x - 14 = -5$

   c) $423 = 34.4x + 251$

   d) $-2.5x - 54 = -99$

   e) $\frac{3}{4}x - 16 = 0.5$

   f) $\frac{x}{3} - 12.5 = -3.5$

   g) $2.5 = -0.6x + 18.5$

   h) $33 = 0.3x + 21$
2. For each equation, gather the like terms and solve for ‘x’

   a) \(-4.25x - 5 = -6.75x - 57.5\)  
   b) \(-4.3x + 437.3 = 1.7x + 53.3\)

   c) \(8x - 4(2.5x + 8) = 5\)  
   d) \(-3x^2 + 163 = 16\)

3. You open a bank account with $57.50 and add a certain amount every month. After 17 months, your account contains $610.00.

   a) What does ‘x’ represent in this problem? ____________________

   b) How much money do you add to the account every month?

   Every month, you add $ ____________________ to the account.
1. For each equation, gather the like terms and solve for ‘x’

a) $4x + 3 = 127$

b) $2.75x - 19 = 47$

c) $620 = 28.2x + 197$

d) $-3.5x - 44 = -100$

e) $\frac{7}{4}x - 16 = -44$

f) $\frac{x}{3} - 12.5 = 14.5$

g) $14 = -0.1\bar{6}x + 11$

h) $27 = 0.0\bar{8}3x + 17$
2. For each equation, gather the like terms and solve for ‘x’

   a) \(-7.75x + 23 = -4.25x - 57.5\)  
   b) \(-1.5x + 173 = 3.25x + 11.5\)

   c) \(9x - 2(3x + 5) = 28\)  
   d) \(-8x^2 - 33 = -83\)

3. You take 5 friends out and everyone, including yourself, gets a large ice cream. You pay with $40 and, after you leave a 5$ tip, you receive $8.60 in change.

   a) What does ’x’ represent in this problem? ____________________

   b) How much does one large ice cream cost?

   A large ice cream costs $___________
4. You start a bank account with $360 and withdraw $45 a month every month.
   a) What does ‘x’ represent in this problem? _______________________
   b) How many months will it take until you have $90 remaining in your account?

   It would take _____________ months until you have $90 remaining.

5. You fill a bathtub with 490L of water and it drains at a rate of 35L per minute.
   a) What does ‘x’ represent in this problem? _______________________
   b) After how many minutes will the bathtub be empty?

   The bathtub will be empty after ________________ minutes.
Memory Aid:
Formulas, Notes & Reminders
# Equation of a Line – 01

1. Find the slope from each of the given pairs of coordinates.

<p>| | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>a) (3, 5) and (4, 1)</td>
<td>b) (6, 2) and (3, 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope: __________</td>
<td>Slope: __________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) (0, -3) and (7, -1)</td>
<td>d) (5, 5) and (6, 4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope: __________</td>
<td>Slope: __________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) (7, 6) and (8, 9)</td>
<td>f) (-2, -4) and (-1, -3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope: __________</td>
<td>Slope: __________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) (-3, -5) and (0, 0)</td>
<td>h) (3, 5) and (3, -1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slope: __________</td>
<td>Slope: __________</td>
<td></td>
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</tr>
</tbody>
</table>
2. Find the slope from the graphs below.

a)

b)

c)

d)

Slope: a = __________

Slope: a = __________

Slope: a = __________

Slope: a = __________
Slope: a = ____________

Slope: a = ____________

Slope: a = ____________

Slope: a = ____________
1. Find the slope of the line that passes through these sets of coordinates.

a) \((19, -16)\) and \((-7, -15)\)  
b) \((1, -19)\) and \((-2, -7)\)

c) \((-4, 7)\) and \((-6, -4)\)  
d) \((20, 8)\) and \((9, 16)\)

e) \((3, 0)\) and \((-11, -15)\)  
f) \((19, -2)\) and \((-11, 10)\)

2. Find the slope of each line.
3. Find the slope (a) and y-intercept (b) of each line below.

a) \( y = -5x - 1 \)  
   \( a = \) _______  
   \( b = \) _______

b) \( y = 13x - 4 \)  
   \( a = \) _______  
   \( b = \) _______

c) \( y = -15x - 4 \)  
   \( a = \) _______  
   \( b = \) _______

d) \( x = 1 \)  
   \( a = \) _______  
   \( b = \) _______

e) \( y = 14x + 1 \)  
   \( a = \) _______  
   \( b = \) _______

f) \( y = -23x - 1 \)  
   \( a = \) _______  
   \( b = \) _______

g) \( 5y = -10x + 20 \)  
   \( a = \) _______  
   \( b = \) _______

h) \( 2y = -2x - 10 \)  
   \( a = \) _______  
   \( b = \) _______

i) \( 2x + 3y = 9 \)  
   \( a = \) _______  
   \( b = \) _______
4. Find the slope and $y$-intercept of each line below:

a)

\[
a = \underline{\phantom{000}}, \quad b = \underline{\phantom{000}}
\]

b)

\[
a = \underline{\phantom{000}}, \quad b = \underline{\phantom{000}}
\]

c)

\[
a = \underline{\phantom{000}}, \quad b = \underline{\phantom{000}}
\]

d)

\[
a = \underline{\phantom{000}}, \quad b = \underline{\phantom{000}}
\]
1. Find the slope of the line that passes through these sets of coordinates.

a) \((-4, -16)\) and \((8, 20)\)  
b) \((4, -2)\) and \((-7, 20)\)

c) \((-12, -18)\) and \((42, 9)\)  
d) \((-8, -6)\) and \((14, 27)\)

e) \((-9, 9)\) and \((30, -17)\)  
f) \((-21, -60)\) and \((18, 44)\)

2. Find the slope of the line below (assume a scale of 1 on both axes).
3. For each of the following, sketch the line based on the description provided.

a) a positive slope and a positive y-intercept (ex: \( y = ax + b \))

b) a negative slope and a positive y-intercept (ex: \( y = -ax + b \))

c) a positive slope and a negative y-intercept (ex: \( y = ax - b \))

d) a negative slope and a negative y-intercept (ex: \( y = -ax - b \))
4. For each of the following equations:
   • identify the slope (a) and y-intercept (b).
   • sketch the y-intercept on the graph.
   • show the direction of the slope.

a) \( y = -7x + 3 \)  
b) \( y = 6x - 4 \)  
c) \( y = 40x - 300 \)

\[
\begin{align*}
a &= \underline{\hspace{2cm}} \\
b &= \underline{\hspace{2cm}} \\
a &= \underline{\hspace{2cm}} \\
b &= \underline{\hspace{2cm}}
\end{align*}
\]

\[
\begin{align*}
\text{d) } 4y &= 12x - 20 \\
\text{e) } -3y &= 15x - 36 \\
\text{f) } 4.5y &= 18x - 27
\end{align*}
\]

\[
\begin{align*}
a &= \underline{\hspace{2cm}} \\
b &= \underline{\hspace{2cm}} \\
a &= \underline{\hspace{2cm}}
\end{align*}
\]
g) $5y - 30 = 45x$

h) $12y + 60 = -48x$

i) $-3y + 24 = 72x$

\[
a = \underline{\quad} \\
b = \underline{\quad}
\]
Equation of a Line – 04

1. Find the slope of the line that passes through these sets of points.
   a) \((-4, 18)\) and \((8, -24)\)  
   b) \((-6, -44)\) and \((30, 190)\)
   c) \((-45, 0)\) and \((36, -18)\)  
   d) \((-4, -26)\) and \((6, 19)\)

2. Find the slope, the y-intercept, and write the equation for each line below.
   a)
   b)
   a = ______
   b = ______
   Equation: ______________
   a = ______
   b = ______
   Equation: ______________
3. For each of the following equations:
   • identify the slope (a) and y-intercept (b).
   • sketch the y-intercept on the graph.
   • show the direction of the slope.

a) \( y = 3.5x + 3 \)   \hspace{1cm}  b) \( y = 18x - 4 \)   \hspace{1cm}  c) \( y = -42x + 250 \)

\( a = \) _______ \hspace{1cm}  \( a = \) _______ \hspace{1cm}  \( a = \) _______

\( b = \) _______ \hspace{1cm}  \( b = \) _______ \hspace{1cm}  \( b = \) _______
d) $3y = 12x - 30$

e) $-5y = 45x - 80$

f) $3.5y = 49x + 28$

g) $2y - 50 = 16x$

h) $4y + 60 = 48x$

i) $-6y + 24 = 72x$
Equation of a Line – Practice Quiz A

1. Find the slope of the line that passes through these sets of points.
   a) (−123, 86) and (54, −32)   b) (−84, 36) and (24, 0)
   c) (45, 27) and (−63, −57)   d) (−42, −117) and (150, 395)

2. Find the slope, the y-intercept, and write the equation of the lines below.

   a) [Graph]

   a = ________

   b = ________

   Equation: _____________

   b) [Graph]

   a = ________

   b = ________

   Equation: _____________
3. For each of the following equations:
   - identify the slope (a) and y-intercept (b).
   - sketch the y-intercept on the graph.
   - show the direction of the slope.

   a) \( y = 2.5x - 4 \)  
   b) \( y = 14x + 3 \)  
   c) \( y = -6x + 4 \)

   a = _____  
   a = _____  
   a = _____  

   b = _____  
   b = _____  
   b = _____  

   Equation: ____________  
   Equation: ____________
d) \(-5y = 10x + 15\)  
e) \(-3y = -6x + 18\)  
f) \(-8y = 72x - 108\)

\[
\begin{align*}
\text{a} &= \underline{\phantom{1000}} \\
\text{b} &= \underline{\phantom{1000}}
\end{align*}
\]

\[
\begin{align*}
\text{a} &= \underline{\phantom{1000}} \\
\text{b} &= \underline{\phantom{1000}}
\end{align*}
\]

\[
\begin{align*}
\text{a} &= \underline{\phantom{1000}} \\
\text{b} &= \underline{\phantom{1000}}
\end{align*}
\]

\[
\begin{align*}
\text{g}) \quad 6x + 2y &= 30 \\
\text{h}) \quad 9x - 4.5y &= -36 \\
\text{i}) \quad 3y + 51 &= 18x
\end{align*}
\]

\[
\begin{align*}
\text{a} &= \underline{\phantom{1000}} \\
\text{b} &= \underline{\phantom{1000}}
\end{align*}
\]

\[
\begin{align*}
\text{a} &= \underline{\phantom{1000}} \\
\text{b} &= \underline{\phantom{1000}}
\end{align*}
\]

\[
\begin{align*}
\text{a} &= \underline{\phantom{1000}} \\
\text{b} &= \underline{\phantom{1000}}
\end{align*}
\]
1. Find the slope, the y-intercept, and write the equation of the lines below.

a) 

Equation: __________________

b) 

Equation: __________________

c) 

Equation: __________________

d) 

Equation: __________________
2. What is the equation of a line that has a $y$-intercept of $(0, -6)$ and also passes through the point $(14, 43)$?

Equation: ____________________

3. What is the equation of a line that has a $y$-intercept of $(0, -12)$ and also passes through the point $(14, 44)$?

Equation: ____________________
4. What is the equation of a line that has a y-intercept of (0, 8) and also passes through the point (−6, 14)?

Equation: ____________________

5. What is the equation of a line that has a y-intercept of (0, −4) and also passes through the point (−8, 0)?

Equation: ____________________
1. For each of the following questions:

- Write out $y = ax + b$
- Label the two given points $(x_1, y_1)$ and $(x_2, y_2)$
- Calculate the slope $(a)$ from these two points, using $a = \frac{y_2 - y_1}{x_2 - x_1}$
- Plug either set of coordinates $(x_1, y_1)$ or $(x_2, y_2)$ into the $y = ax + b$ equation, along with the number you just calculated for $a$
- Solve for $b$
- Rewrite the $y = ax + b$ equation with the values you found for $a$ and $b$

a) (-4, -5) and (12, 27)

b) (-4, 9) and (2, -15)
c) \((12, 4.5)\) and \((-18, -5.5)\)

\[
\text{Equation: } \underline{\phantom{000000000}}
\]

d) \((15, -11.5)\) and \((-3, 0.5)\)

\[
\text{Equation: } \underline{\phantom{000000000}}
\]

e) \((2, 21)\) and \((-3, 0.5)\)

\[
\text{Equation: } \underline{\phantom{000000000}}
\]
Exceptions in the Equation of a Line – 01

1. Identify the slope and \( y \)-intercept, then write the equation of the line in the Cartesian-grid below:

![Cartesian-grid with points (0, 3) and (6, 3)]

2. Identify the slope and \( y \)-intercept, then write the equation of the line in the Cartesian-grid below:

![Cartesian-grid with points (0, -4) and (6, -4)]

3. Identify the slope and \( y \)-intercept, then write the equation of the line in the Cartesian-grid below:

![Cartesian-grid with points (2, 3) and (2, 0)]
4. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:

5. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:

6. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:
7. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:

![Cartesian-grid with points (0, 0) and (20, 4)]

8. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:

![Cartesian-grid with points (0, 0) and (15, -5)]

9. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:

![Cartesian-grid with points (0, 0) and (2, 10)]
10. Identify the slope and y-intercept, then write the equation of the line in the Cartesian-grid below:

11. Isolate ‘y’ in the following equation, then identify the slope and y-intercept of the rule:

\[ 8x + 8y = 0 \]

12. Isolate ‘y’ in the following equation, then identify the slope and y-intercept of the rule:

\[ 6x - 4y - 42 = 0 \]
X – and Y – Intercepts – 01

1. What is the equation of a line with a slope of \(\frac{2}{5}\) and a \(y\)-intercept of -2?
   (Sketch the graph)

   Equation: _________________________

2. What is the equation of a line with a slope of -5 and an \(x\)-intercept of 17?
   (Sketch the graph)

   Equation: _________________________
3. What is the equation of a line with an \textbf{x-intercept of 6} and a \textbf{y-intercept of -3}? (Sketch the graph)

4. What is the equation of a line with an \textbf{x-intercept of 8} and a \textbf{y-intercept of 16}? (Sketch the graph)
5. What is the **y-intercept** of a line passing through **(-12, -8)** and **(36, 4)**?

Y-intercept: (0, _______)

6. What is the **x-intercept** of a line passing through **(-12, -8)** and **(36, 4)**?

X-intercept: (_______, 0)
7. What is the **y-intercept** of a line passing through \((-24, 16)\) and \((18, 2)\)?

\[
\text{Y-intercept: ( 0 , _______ )}
\]

8. What is the **x-intercept** of a line passing through \((-24, 16)\) and \((18, 2)\)?

\[
\text{X-intercept: ( _______ , 0 )}
\]
X - and Y - Intercepts – 02

1. What is the equation of a line with a slope of $\frac{-1}{3}$ and a y-intercept of 4? (Sketch the graph)

   Equation: ________________________

2. What is the equation of a line with a slope of 3 and an x-intercept of 6? (Sketch the graph)

   Equation: ________________________
3. What is the equation of a line with a slope of \( \frac{2}{3} \) and an x-intercept of -12? (Sketch the graph)

Equation: _______________________

4. What is the equation of a line with an x-intercept of 16 and a y-intercept of -2? (Sketch the graph)

Equation: _______________________

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5. What is the equation of a line with an \textbf{x-intercept of 9} and a \textbf{y-intercept of 6}? (Sketch the graph)

\[ y = \frac{x}{3} \]

6. What is the \textbf{x-intercept} of a line passing through (-25, -33) and (15, -9)?

\[ x = \frac{-16}{5} \]
X - and Y - Intercepts - 03

1. What are the coordinates of point C?

   C (________, _______)

2. What are the coordinates of point B?

   B (_______, _______)

   \[ 5y - 12.5x - 15 = 0 \]

   \[ 4y - 2x - 14 = 0 \]
3. What are the coordinates of point A

\[ 6y + 1.5x - 48 = 0 \]

A \((______, _____)\)

4. What are the coordinates of point D?

\[ 9y + 3x - 135 = 0 \]

D \((______, _____)\)
5. Find the value of the missing coordinate.

6. Find the value of the missing coordinate.

Answer (30, _____)

Answer (16, _____)
7. Find are the values of the missing coordinates. \((-7, 225)\)

\[
\text{Answer (________, ______) }
\]

8. Find are the values of the missing coordinates.

\[
\text{Answer (_______, ______) }
\]
1. What is the equation of a line with a slope of $\frac{-2}{5}$ and a y-intercept of 5?
   Sketch the graph (1 pt)

   Equation: ____________________________

2. What is the equation of a line with a slope of $\frac{-2}{3}$ and an x-intercept of 13?
   Sketch the graph (1 pt)

   Equation: ____________________________
3. What is the equation of a line with an **x-intercept of 16** and a **y-intercept of -2**? Sketch the graph (1 pt)

Equation: ______________________

4. What are the coordinates of point B?

B (______, ______)
5. What is the **y-intercept** of a line passing through (-512, 89) and (1024, -103)?

![Graph showing a line passing through the points (-512, 89) and (1024, -103).]

**Y-intercept (____, ______)**

6. What is the **x-intercept** of a line passing through (1664, -24) and (-832, -180)?

![Graph showing a line passing through the points (1664, -24) and (-832, -180).]

**X-intercept (____, ______)**
Parallel Lines – 01

1. **a)** What is the **rule** for the linear equation that passes through points A and B

   A (-3, -13)
   B (4, 22)

   ![Diagram showing points A and B on a coordinate plane]

   **b)** What do we know about a line that is **parallel** to AB?

   **c)** What is the rule for a line travelling **parallel** to AB, but that passes through point (1, 26)?
2. What is the equation of a line travelling parallel to one defined by the rule 
\( y = -3x + 2 \), but that passes through point \((-6, -5)\) instead?

3. What is the equation of a line travelling \textit{parallel} to one defined by the rule 
\( 2y = 5x + 30 \), but that passes through point \((6, 11)\)?

4. What is the equation of a line travelling \textit{parallel} to one defined by the rule 
\( 5y + 15x - 30 = 0 \), but that passes through point \((-2, 14)\)?
5. Lines AB and CD are **parallel**.
What is the equation of line CD?
1. What is the rule for the linear equation that passes through points A and B

A (-2, -35)
B (6, 25)

Equation: _______________

2. What is the rule for a line travelling parallel to -5y = -15x + 40, passing through point P (-2, -1)?

Equation: _______________
3. What is the equation of a line travelling *parallel* to one defined by the rule \(3y + 6x - 48 = 0\), but passing through point \((-8, 12)\)?
4. What is the **x-intercept** of a line travelling parallel to one defined by the rule $3y + 2x + 12 = 0$, but passing instead through (-18 , 22)?

**X-intercept (_______, _______)**
5. Are the following lines parallel and distinct, parallel and coincident, or not parallel at all? Explain your answer.

Line 1: \(4y = 10x - 24\)  
Line 2: \(-15x + 6y + 36 = 0\)

**Answer:** The two lines are ____________________________

**Justification** (Explanation):

____________________________________________________________________________________

___________________________________________________________________________________________
6. Are the following lines parallel and distinct, parallel and coincident, or not parallel at all? Explain your answer.

Line 1: \[ 6x - 3y + 15 = 0 \]

Line 2: \[ -2x + y = -4 \]

Answer: The two lines are ____________________________

Justification (Explanation):

___________________________________________________________________________________________

___________________________________________________________________________________________
Are the following lines parallel and distinct, parallel and coincident, or not parallel at all? Explain your answer.

Line 1: \(-4x + 0.5y = 10\)  
Line 2: \(y = -2x + 6\)

Answer: The two lines are __________________________

Justification (Explanation):
___________________________________________________________________________________________
___________________________________________________________________________________________

60
8. What is the y-intercept of a line travelling parallel to one passing through (-9, 1) and (12, 8), but passing instead through (-24, -16)?

\[
\text{Y-intercept (_______, _______)}
\]
Parallel Lines – Practice Test 01

1. What is the slope of a line travelling parallel to a line that passes through points C and D?

   C ( -24 , 22 )
   D ( 18 , -6 )

   The slope is: ___________________

2. What is the rule for a line travelling parallel to $10y = 4x + 102$, passing through (-60, -30.5)?

   Equation: ____________________
3. What is the equation of a line travelling parallel to one defined by the rule 
\[-16x - 20y - 50 = 0\], but passing through point \((-5, 5.2)\)?

Equation: ______________________

4. Are the following lines parallel or not? Explain your answer.

   Line 1: \[14x + 4y = 24\]
   Line 2: \[12y = 42x + 72\]

Answer: The two lines are ______________________

Justification (Explanation):

___________________________________________________________________________________________

___________________________________________________________________________________________

___________________________________________________________________________________________
5. What are the coordinates of point C?

C (______, ______)
6. What are the coordinates of point D?
7. Are the following lines parallel and coincident or parallel and distinct? Explain your answer.

Line 1: \(3y = \frac{3}{2}x + 36\)  
Line 2: \(4y - 2x = -48\)

**Answer:** The two lines are __________________________

**Justification (Explanation):**

___________________________________________________________________________________________

___________________________________________________________________________________________

___________________________________________________________________________________________
Perpendicular Lines – 01

1. What are the **negative reciprocals** of the numbers given below?

a. \(-\frac{2}{3}\)  
   Answer: __________

b. 8  
   Answer: __________

c. \(\frac{4}{5}\)  
   Answer: __________

d. 2  
   Answer: __________

e. -1.25  
   Answer: __________

f. 0.3  
   Answer: __________

g. 6  
   Answer: __________

h. -0.125  
   Answer: __________

i. 0.1  
   Answer: __________

j. 4  
   Answer: __________

k. 0.5  
   Answer: __________

l. 1.5  
   Answer: __________
2. a) What is the slope of a line that passes through points C and D

   C (-8, -22)
   D (4, 2)

b) What would the slope be for a line that is perpendicular to CD?

c) What would the equation be for this new perpendicular line if it were to pass through (-10, 8)?

3. What is the rule for a line travelling perpendicular to \(10y = 8x - 30\), passing through (4, 1)?

4. What is the equation of a line travelling perpendicular to one defined by the rule \(2y - 6x + 12 = 0\), but passing through point (-9, 8)?
5. Are the following lines **perpendicular or not**? Explain your answer.

Line 1: \( y = 4x + 5 \)  
Line 2: \( y = -0.25x + 8 \)

**Answer:** The two lines are ________________

**Justification** (Explanation):

___________________________________________________________________________________________

___________________________________________________________________________________________
6. Are the following lines **perpendicular or not**? Explain your answer.

   Line 1: \[ y = \frac{3}{2} x + 1 \]  
   Line 2: \[ y = \frac{2}{3} x - 1 \]

**Answer:** The two lines are ________________

**Justification** (Explanation):

___________________________________________________________________________________________

___________________________________________________________________________________________
7. Line 1 and Line 2 are perpendicular. What is the equation of line 2?

Answer: ____________________________________________________________________
Perpendicular Lines – 02

1. Fill in the blanks.
   - Parallel lines have ________________________________ slopes.
   - Perpendicular lines have ________________________________ slopes.

2. What is the negative reciprocal (NRS) of the following numbers?
   a. \(-0.1\)  
      Answer: ____________
   b. 1.5  
      Answer: ____________
   c. 0.75  
      Answer: ____________
   d. \(-0.2\)  
      Answer: ____________
   e. \(-2.6\)  
      Answer: ____________

3. What is the rule for a line travelling \textit{perpendicular} to \(3y = -1x + 10\), passing through \((-7, -25)\)?

   Equation: _______________________________
4. What is the rule for a line travelling *perpendicular* to one defined by the rule \(5y + 30x + 10 = 0\), but passing through point \((-27, -9)\)?

Equation:

5. What is the y-intercept of a line travelling *perpendicular* to one passing through \((-16, 0)\) and \((12, 14)\), but passing instead through \((5, 10)\)?

Y-intercept \((__, ____)\)
6. Are the following lines **perpendicular or not**?
Explain your answer.

Line 1: \( y = \frac{4}{5}x - 30 \)  
Line 2: \(-2y - 2.5x + 48 = 0\)

**Answer:** The two lines are __________________________

**Justification** (Explanation):

___________________________________________________________________________________________
___________________________________________________________________________________________
7. Line 1 has an **x-intercept** of 9 and a **y-intercept** of 15.

Line 2 is **perpendicular** to line 1. Line 2 passes through point (5, -9). What is the **x-intercept** line 2?

\[ \text{X-intercept } (\underline{\underline{\text{________}_1}}, \underline{\underline{\text{________}_2}}) \]
1. What is the negative reciprocal of the following numbers?

   a. $-2$  
      Answer: ________________

   b. 3  
      Answer: ________________

   c. 0.8  
      Answer: ________________

   d. $-0.6$  
      Answer: ________________

   e. $-2.5$  
      Answer: ________________

2. What is the rule for a line travelling perpendicular to $4y = -2x + 16$, passing through $(−6, −25)$?

   Equation: _________________________
3. What is the rule for a line travelling **perpendicular** to one defined by the rule \(3y + 2x - 12 = 0\), but passing through point \((7, 7)\)?

4. What is the **equation** of line 2?
5. Line 1 has an x-intercept of -12.5 and a y-intercept of 10

Line 2 is perpendicular to line 1.
Line 2 passes through point (4, -10)

a) What is the equation of line 2?
b) What is the x-intercept of line 2?

Equation: ________________________

X-intercept \( (_______, \) _______ )
6. Line 1 has an **x-intercept of 18** and a **y-intercept of -12**.

Line 2 is **perpendicular** to line 1.
Line 2 passes through point **(-8, 21)**

a) What is the equation of line 2?
b) What is the **y-intercept** of line 2?

---

Equation: _______________________

Y -intercept ( ________ , _______ )
Parallel and Perpendicular Combined – 01

1. What is the equation of a line parallel to \( y = -3x + 5 \), passing through \((-3.5, 4.5)\)?

Equation: _______________________________

2. What is the equation of a line parallel to \( 3x - 2y + 10 = 0 \), passing through \((-4, -8)\)?

Equation: _______________________________
3. Line 1 and Line 2 are parallel. What is the equation of line 2?

Equation:

4. What is the equation of a line perpendicular to \( y = 0.25x - 4 \), passing through (3, 0)?

Equation:
5. What is the equation of a line *perpendicular* to $3y - 15x - 6 = 0$, passing through $(25, 8)$?

6. What is the equation of line 2?
7. What are the coordinates of point C?

C(_______,_______)
8. What are the coordinates of point D?

D(______,______)
9. Are the following equations parallel, perpendicular, or something else?
Justify your answer.

Line 1: \[-15x + 6y + 48 = 0\]

Line 2: \[8y = -3.2x + 48\]

The two lines are

[ ] Parallel
[ ] Perpendicular
[ ] Neither Parallel, nor Perpendicular

Justification:
____________________________________________________________________________________________________________
____________________________________________________________________________________________________________
10. What is the **equation** of a line *parallel* to: \( 4y - 1x - 20 = 0 \), passing through \((8, -1)\)?

11. What is the **equation** of line 2?

Equation:
12. What is the equation of a line perpendicular to \( y = 2.5x - 5 \), passing through \((10, 12)\)?

13. What is the equation of line 2?
14. Are the following equations parallel, perpendicular, or something else? Justify your answer.

Line 1: \(-12x + 8y = 16\)

Line 2: \(2x + 3y + 18 = 0\)

The two lines are

[ ] Parallel

[ ] Perpendicular

[ ] Neither Parallel, nor Perpendicular

Justification:

__________________________________________________________________________________
__________________________________________________________________________________

15. What are the coordinates of point C?

\(C (\quad , \quad )\)
16. What are the coordinates of point D?

D(______,______)

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1) Solve for ‘x’.

a) \(2x + 3 = 3x - 4\)

b) \(6x + 9 = 4x + 11\)

c) \(-3x + 2 = 2x - 18\)

d) \(12x + 7 = 15x - 14\)

e) \(\frac{1}{3}x - 4.5 = -\frac{5}{3}x + 6.25\)

f) \(\frac{1}{2}x + 11 = \frac{1}{4}x - 2.5\)
2) What are the coordinates of the point where the following two lines meet?

Equation 1: \[ 2y = -1x + 8 \]  
Equation 2: \[ 4y = 6x - 16 \]

Answer (______, _______)

3) What are the coordinates of the point where the following two lines meet?

Equation 1: \[ 3y = 6x - 9 \]  
Equation 2: \[ 4y = -4x + 24 \]

Answer (______, _______)

4) What are the coordinates of the point where the following two lines meet?

Equation 1: \[ 6y - 9x + 42 = 0 \]  
Equation 2: \[ 5y + 10x - 35 = 0 \]

Answer (______, _______)
5) What are the coordinates of the point where both lines from the graph below intersect?

Line 1: \( y = 0.25x + 9 \)

Line 2: \( y = -2x + 18 \)

Answer: ( ______ , ______ )

6) What are the coordinates of the point where both lines from the graph below intersect (meet)?

Answer ( ______ , ______ )
1) What is the value of ‘y’ when both equations below intersect (meet)?

\[ 3y = 45x + 180 \quad \text{and} \quad 2y = 26x + 160 \]

Answer (________, _______)

2) What is the value of ‘y’ when both equations below intersect (meet)?

\[ 2y = 7x + 24 \quad \text{and} \quad 4y = 22x - 72 \]

Answer (________, _______)

3) What is the value of ‘y’ when both equations below intersect (meet)?

\[ 2y = 3x - 14 \quad \text{and} \quad 3y + 4.5x - 6 = 0 \]

Answer (________, _______)

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4) **Sarah** and **Ashley** both work at the same store. Sarah gets a **15$ base salary** and earns **4$ for every shirt** that she sells. Ashley gets a **25$ base salary** and earns **3$ for every shirt** that she sells.

Sketch a graph of this situation

![Graph](image)

a) How many shirts must Sarah and Ashley each sell to make the same amount of money?  
b) How much money will they each earn?

**Sarah’s Rule:**  

**Ashley’s Rule:**  

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Number of shirts when they make the same money = ____________________ shirts</td>
<td></td>
</tr>
<tr>
<td>b) Amount of money they earn when they make the same money = $ ____________</td>
<td></td>
</tr>
</tbody>
</table>
5) Nicole and Dahlia own car rental companies and are charging different rates to rent a car. Nicole charges \(0.75\) per kilometer and \(100\) up front. Dahlia charges \(0.90\) per kilometer and \(70\) up front.

Sketch a graph of this situation

At some point, both Nicole and Dahlia will charge the same amount of money for having driven the same number of kilometers.

a) How many km will they have travelled when they reach that point?

b) How much do the rentals cost at that point?

Nicole’s Rule: ___________________ Dahlia’s Rule: ___________________

\[ \text{a) Number of km travelled when they each charge the same amount: } \underline{\text{\hspace{1cm}}} \text{ km} \]

\[ \text{b) Cost of the car rental at the point when they charge the same amount: } \underline{\text{\hspace{1cm}}} \text{ \$} \]
1. What is the point of intersection between the lines defined by the linear equations below?
   Eq. 1) $y = 4.5x + 8$
   Eq. 2) $y = -3.5x - 64$
   Answer (______, _______)

2. What is the point of intersection between the lines defined by the equations below?
   Eq. 1) $2y = 5x + 8$
   Eq. 2) $4y + 6x + 48 = 0$
   Answer (______, _______)

Systems of Equations – 03
3. What is the **point of intersection** between lines 1 and 2 shown below?

\[
\text{Line 1} \quad y = 1.5x - 8
\]

\[
\text{Line 2} \quad y = -3.5x + 32
\]

Answer (_____ , _____)
4. What is the *point of intersection* between lines 1 and 2 shown below?

\[ y = 3.5x + 4 \]

Answer \((_______,_______)\)
5. What is the *point of intersection* between lines 1 and 2 shown below?
   (Hint: N.R.S.)

![Graph showing the point of intersection between two lines.]

Answer (______, ____ )
1. What is the *point of intersection* between the lines defined by the linear equations below?

   Eq. 1) \( y = -4.5x - 164 \)  
   Eq. 2) \( y = 7.5x + 94 \)

Answer (________,________)

2. What is the *point of intersection* between the lines defined by the equations below?

   Eq. 1) \( 6y = 5x - 42 \)  
   Eq. 2) \( 1x + 3y - 84 = 0 \)

Answer (________,________)
3. What is the point of intersection between lines 1 and 2 shown below?

Line 1: 
\[ y = -0.4x + 18 \]

Line 2: 
\[ y = 1.5x + 8.5 \]

Answer (______, ____ )
4. What is the point of intersection between lines 1 and 2 shown below?

Answer (_____, _____)
5. Thomas has lost the ‘price list’ from the school cafeteria.

Yesterday, 2 milks and 3 muffins cost $3.25
Today 5 milks and 2 muffins cost $4.00

How much will it cost tomorrow if Thomas buys 4 milks and 1 muffin?

Answer: 4 milks and 1 muffin will cost $___________________
Systems of Equations – Practice Quiz 01

1. What is the point of intersection between the lines defined by the linear equations below?
   Eq. 1) \( y = -\frac{1}{2}x - 14.5 \)  
   Eq. 2) \( y = \frac{4}{5}x + 18 \)
   Answer (______, _______)

2. What is the point of intersection between the lines defined by the equations below?
   Eq. 1) \( 3y = -2x - 18 \)  
   Eq. 2) \( 4x + 3y = 72 \)
   Answer (______, _______)

104
3. What is the *point of intersection* between lines 1 and 2 shown below?

\[
2y = 3x + 68
\]

Line 2:

\[
-5x + y - 6 = 0
\]

Answer (______, ______)
4. Line 1 and line 2 are meet at 90 degrees.
   What is the point of intersection between lines 1 and 2 shown below?

Answer (______, ______)
5. Orlando is a popular field trip destination.
This year and last, the senior class at Mac High planned trips there.

Last year, the senior class rented and filled 1 van and 6 buses with 324 students.
This year, the senior class filled 9 vans and 3 buses with 264 students.

Every van had the same number of students in it, as did the buses.

a) How many students can a van carry?
b) How many students can a bus carry?

Answer: A van can carry ____________ students
A bus can carry ____________ students
1. Which of the following statements about the system of equations below is true?

Eq. 1) \(-3x + 2y + 4 = 0\)  
Eq. 2) \(5x + 3y = 15\)

A) The system has one unique solution  
B) The system has two unique solutions  
C) The system has no solutions  
D) The system has an infinite number of solutions

**Answer:** ________

Justify your answer:

________________________________________________________________________________________________________________
_________________________________________________________________________________________________________

_________________________________________________________________________________________________________
2. Which of the following statements about the system of equations below is true?

Eq. 1) \( y = 8x - 4 \)  
Eq. 2) \( -3y = -24x + 6 \)

A) The system has one unique solution  
B) The system has two unique solutions  
C) The system has no solutions  
D) The system has an infinite number of solutions

Answer: ________

Justify your answer:

________________________________________________________________________________________________________________
________________________________________________________________________________________________________________
3. Which of the following statements about the system of equations below is true?

Eq. 1) \(5x + 2y - 30 = 0\)  
Eq. 2) \(-2.5x - y = -15\)

A) The system has one unique solution  
B) The system has two unique solutions  
C) The system has no solutions  
D) The system has an infinite number of solutions

Answer: ________

Justify your answer:

________________________________________________________________________________________________________________
_____________________________________________________________________________________________________________
________________________________________________________________________________________________________________
4. Which of the following statements about the system of equations below is true?

Eq. 1) \(3.5x - 6y = 144\)  
Eq. 2) \(6x + 3y = 27\)

A) The system has one unique solution  
B) The system has two unique solutions  
C) The system has no solutions  
D) The system has an infinite number of solutions

Answer: ________

Justify your answer:

________________________________________________________________________________________________________________
__________________________________________________________________________________________________________

5. Which of the following statements about the system of equations below is true?

Eq. 1) \(-4x + 10y + 85 = 0\)  

Eq. 2) \(15y = 6x - 127.5\)

E) The system has one unique solution  
F) The system has two unique solutions  
G) The system has no solutions  
H) The system has an infinite number of solutions

Answer: ________

Justify your answer:
________________________________________________________________________________________________________________
_________________________________________________________________________________________________
6. Which of the following statements about the system of equations below is true?

Eq. 1) $2.5x + 4.5y = 120$

Eq. 2) $15x + 27y - 240 = 0$

I) The system has one unique solution
J) The system has two unique solutions
K) The system has no solutions
L) The system has an infinite number of solutions

**Answer: ________**

Justify your answer:

________________________________________________________________________________________________________________
__________________________________________________________________________________________________


1) Cristina works at Best Buy selling LED and Plasma TVs.

- Last month, she sold 23 LEDs and 4 plasmas and made $22,350
- This month, she sold 42 LEDs and 6 plasmas, and made $39,900.

- What does ‘x’ represent in this problem? ______________________
- What does ‘y’ represent in this problem? ______________________

a) How much does an LED tv cost?
b) How much does a plasma TV cost?
c) If Christina sells 30 LEDs and 20 plasmas, how much will she make?

Answer: An LED TV costs: _________________ $
A plasma TV costs: _________________ $
30 LEDs and 20 plasmas would earn her _________________ $
2) Marina sells small and large chocolate bars and gets them delivered to the school every month. Each delivery arrives in a box with the weight of the contents indicated.

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Large</th>
<th>Total weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>16</td>
<td>8</td>
<td>3520</td>
</tr>
<tr>
<td>October</td>
<td>10</td>
<td>25</td>
<td>6200</td>
</tr>
<tr>
<td>November</td>
<td>18</td>
<td>13</td>
<td>?</td>
</tr>
</tbody>
</table>

- What does ‘x’ represent in this problem? ____________________________
- What does ‘y’ represent in this problem? ____________________________

a) How much does a small bar weigh?
b) How much does a large bar weigh?
c) How much would **18 small bars** and **13 large bars** weigh?

**Answer:**
A small bar weighs: _____________ g
A large bar weighs: _____________ g
**18 small bars** and **13 large bars would** weigh ___________ g
3) A bakery sells croissants and pastries to its customers.

- Alex spends $18 on 6 croissants and 4 chocolate pastries.
- Ryan spends $19.50 on 4 croissants and 6 pastries.

- What does ‘x’ represent in this problem? _________________________
- What does ‘y’ represent in this problem? _________________________

a) How much does a croissant cost?
b) How much does a pastry cost?
c) How much will Dennis pay for 3 croissants and 3 chocolate pastries at this bakery?

**Answer:**
A croissant will cost $___________
A pastry will cost $______________
Dennis will pay ________________ $ for 3 croissants and 3 pastries
1. Jeff works at Centre HiFi and loses his pricing guide.

   o He knows that last week, he sold 10 TVs and 8 stereos and made 8360$.
   o The week before, he sold 6 TVs and 12 stereos and made 8040$.

   • What does ‘x’ represent in this problem? _____________________________
   • What does ‘y’ represent in this problem? _____________________________

   a) How much does a TV cost?
   b) How much does a stereo cost?
   c) How much money would Jeff expect to make if he sold 10 TVs and 12 stereos?

Answer:
A TV will cost $ ___________________ 
A stereo will cost $ __________________ 
Jeff will make $ ___________________ for 10 TVs and 12 stereos
2. The cafeteria has changed its prices. Mr. Auger goes to buy milk and cookies 3 days in a row.

- On the first day, he buys 3 cookies and 4 milks for a total of 8.15$
- The next day, he buys 5 cookies and 3 milks for a total of 9.55$

- What does ‘x’ represent in this problem? ________________________
- What does ‘y’ represent in this problem? ________________________

a) How much does an cookie cost?
b) How much does a milk cost cost?
c) If Mr. Auger spent 21.75$ on the final day, buying 5 milks and some cookies, how many cookies did he order?

Answer:  
An cookie costs: ________________ $
A milk costs: ________________ $
Auger bought _____________ cookies.
3. Collin gets a job at *Footlocker* selling **shoes** and **jerseys**. He keeps a record of his sales in a table but spilled coffee on it and lost some of the data.

<table>
<thead>
<tr>
<th></th>
<th>Shoes</th>
<th>Jerseys</th>
<th>Total sales ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>12</td>
<td>3</td>
<td>1770</td>
</tr>
<tr>
<td>Day 2</td>
<td>6</td>
<td>18</td>
<td>1380</td>
</tr>
<tr>
<td>Day 3</td>
<td>10</td>
<td>60</td>
<td>1760</td>
</tr>
</tbody>
</table>

- What does ‘x’ represent in this problem? __________________________
- What does ‘y’ represent in this problem? __________________________

a) How much does a pair of shoes cost?

b) How much does a jersey cost?

c) **How many jerseys** did Collin sell on day 3?

---

**Answer:**

A pair of shoes costs: $________________

A jersey costs: $________________

On day 3, Collin sold __________ jerseys
1. Mr. Stewart has been invited to join 2 different golf clubs next summer.

He can join at ‘**Angry Birdies**’ for a one time fee of 750$, plus an extra 30$ every time he visits.

He might also join at ‘**Puff Caddie’s**', where they charge 25$ per round with a one time fee of 825$.

a) At what number of visits will the two courses cost the same amount to play?

b) How much will it cost to play at that point?

---

Answer:

a) At ___________ rounds, the cost to play at either course is the same.

b) At that point, it will cost ___________ to play at either course.
2. You work at EB Games selling X-Box Ones and PS4s.

Yesterday, you sold 3 X-Boxes and 5 PS4s and made a total of 3135$. Today, you sold 6 X-Boxes and 4 PS4s and made a total of 4020$.

- What does ‘x’ represent in this problem? ____________________________
- What does ‘y’ represent in this problem? ____________________________

If you made $2715 selling 2 X-Boxes and some other number of PS4s, how many PS4s will you have sold?

Answer:

The number of PS4s sold would be _______________
3. Find the point of intersection between lines 1 and 2.

Point of Intersection (____, _____)
1. Given the following two equations, find the **point of intersection** between the two lines.

   Line 1: \[ y = -\frac{1}{3}x + 8 \]
   
   Line 2: \[ 1x - 6y - 180 = 0 \]

   **Point of Intersection** (________, ______)
2. Find the point of intersection between the two lines below.

Line 1:
\[ y = 2.5x + 13 \]

Point of Intersection (________, _______)
3. Thomas gets a job selling pizza and hot dogs at local soccer games. He keeps a record of his sales in a table.

<table>
<thead>
<tr>
<th></th>
<th>Pizza</th>
<th>Hot dogs</th>
<th>Sales ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game 1</td>
<td>72</td>
<td>50</td>
<td>237</td>
</tr>
<tr>
<td>Game 2</td>
<td>35</td>
<td>40</td>
<td>138.75</td>
</tr>
<tr>
<td>Game 3</td>
<td>90</td>
<td>68</td>
<td>?</td>
</tr>
</tbody>
</table>

- What does ‘x’ represent in this problem? __________________________
- What does ‘y’ represent in this problem? __________________________

d) How much does a slice of pizza cost?
e) How much does he earn for a hot dog?
f) How much money did Thomas earn during game 3?

Answer:
A pizza costs:  $ __________________
A hot dog costs: $ __________________
On day 3, Thomas earned $ __________________
4. Determine the length of the smallest segment.

- What does ‘x’ represent in this problem? _______________________
- What does ‘y’ represent in this problem? _______________________

The smallest segment measures _________ units
Systems of Equation – Practice Test 02

1. Which of the following statements about the system of equations below is true?

   Eq. 1) \( 4y = 6x + 24 \)
   
   Eq. 2) \( 2y - 3x - 12 = 0 \)

   E) The system has one unique solution
   F) The system has two unique solutions
   G) The system has no solutions
   H) The system has an infinite number of solutions

   Answer: __________

2. What is the solution to the system of equations below?

   \[ 4y = 9x + 36, \quad 4y - 10x + 120 = 0 \]

   Answer: The solution to the system of equations is: ( ________ , ________ )
3. Yesterday, Mr. Armstrong bought 8 cookies and 3 sandwiches for $18.80.
   Today, 5 cookies and 4 sandwiches cost him $18.55.
   How much will it cost him if he decides to buy 12 cookies and 2 sandwiches tomorrow?

Answer: 12 cookies and 2 sandwiches will cost $____________________
4. Yesterday, Mr. Maag bought **5 ipads** and **2 apple watches** for $2875
   Today, **3 ipads** and **6 apple watches** cost him $3525
   If, tomorrow, he spends $10675 on **11 ipads** and some **apple watches**, how many watches will he have bought?

   **Answer:** Mr. Maag will have bought ___________ apple watches.
5. Find the point of intersection, C, between lines 1 and 2 below.